JULY 1968
Vol. 33, No. 12

soil conservation

DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

CONSERVATION EDUCATION IN ACTION

SOIL CONSERVATION SERVICE

U. S. DEPARTMENT OF AGRICULTURE

COVER: Students study plants from the New Jersey pine barrens in an "artificial natural area" on their school ground in the Freehold Soil Conservation District.

Learning . . .

A generation of young people, 90 percent of them growing up in cities and towns, needs a chance to learn about natural resources.

This issue of *Soil Conservation* looks at some of the things being done, in schools and out, to give young people an intelligent concern for resources.

On the ground: One lesson is obvious—the place to teach about the outdoors is *outdoors*.

Educator Robert R. Finlay, at our invitation, shares Ohio's experiences in providing "land for learning" to complement classroom instruction (p. 267).

The principle of on-the-ground learning is uppermost also in Educator James Miller's and Conservationist Palmer Skalland's account of outdoor classrooms in Michigan (p. 271).

In both states, as elsewhere, SCS helps teachers and officials plan and establish these outdoor facilities.

Teaching the teachers: Conservationists are learning, secondly, that the need for resource education is so great that they cannot meet it as an incidental activity.

They must direct their efforts to preparing teachers to do the teaching.

One way is through teachers' workshops, like that in Oregon described by Conservationist Roy Johnson (p. 269).

In Indiana, district supervisors arranged for student teachers from the nearby university to extend the efforts of resource specialists. Supervisor Barbara Restle tells that story (p. 275).

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SOIL CONSERVATION is the official magazine of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of the publication was approved by the Bureau of the Budget July 25, 1963.

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Prepared in the Division of Information, Soil Conservation Service, U. S. Department of Agriculture, Washington, D. C. 20250

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Subscription: $2.00 per year, $2.75 foreign. Single copy 20 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.

Land for Learning

By Robert R. Finlay

Education consultant, Ohio State Department of Education, Columbus, Ohio

On school land laboratories, children get to know the out-of-doors OUTDOORS

Many communities have within their boundaries some potentially fine outdoor education areas. What is more, most facilities can be made operative at relatively low costs.

Excellent learning opportunities may exist on either the planned or unplanned portions of a school site. The undeveloped parts of a property generally offer the best terrain for establishing instructional programs. But lawns, landscape plantings, patios, courts, and playgrounds also can be integral parts of the total plan.

Any plot of land

It takes much planning and much cooperation to attain full use of an outdoor laboratory, but the efforts are certainly within the capabilities of most teachers and school administrators.

What, then, is a "school land laboratory?"

It can be any property controlled by the board of education that is readily accessible to students and that may be used to enrich learning about soil and water relationships and plant and animal life. These areas have been referred to as "lands for learning," and the like. In Ohio the term "school land laboratory" has wide acceptance by educators.

A land laboratory may vary in size from a small area close around a school building to an expanse of many acres. One urban elementary school developed an excellent program on a plot that measured 39 by 49 feet. A few rural consolidated schools have areas in excess of 100 acres for laboratory use.

Let us assume that a school has some available land and that there is evident interest in such a project on the part of the school board, administration, and teaching staff.

Experience has shown that the first step should be a preliminary site study. This might best be done by a team which would include an outdoor education specialist, a naturalist, a technician in soil and water management, and a local school administrator. A favorable written report from this group would serve as a basis for additional detailed studies for specific areas; e.g., ponds, marshes, woodlands, old fields, fence rows, and the like.

Preserving natural features

On a newly acquired site it would be highly desirable to work with the architect to preserve a maximum of natural features. Unfortunately, the preservation of these educational resources is usually given little consideration by engineers and architects. As a consequence many excellent school land laboratory sites have been destroyed during construction periods, or, if not obliterated, extensively damaged.

Land laboratories can be used by pupils and teachers at all grade levels. There are usually opportunities for nature study, for observing the effects of plants and animals on each other, for growing plants, and for many kinds of experimentation. All of this can be coupled with developing an appreciation for the out-of-doors.

What mysteries are exposed where the water meets the land? Fortunate is the school that has its own little pond.

Plans for larger sites, especially those adjacent to secondary schools, often include nature or conservation trails, wildlife areas, ponds, woodland management areas, Christmas tree plantations, and other resource-based projects. Possibilities are unlimited if administrators and teachers are aware of the values of outdoor education.

In a recent study of a 150-acre site at a rural consolidated high school, it was found that surface drainage was creating severe erosion problems and that proposed playing fields were being placed on bottom land near a small creek. At the time of visitation, no plans had been made to handle excess water on the area. Now, a complete soil and water conservation plan for the entire property is being prepared with the assistance of the Soil Conservation Service. Preliminary studies indicate that some diversions will be constructed, a spring will be developed, streambanks will be improved, a small shallow pond will be created, and a larger pond of greater depth will be established. The drainage problems of the school ground will be solved by the planned conservation work. Although some of the work will be done under contract, much can be done by students in the vocational agriculture and biology classes.

What will these changes mean in terms of outdoor educational experiences?

It is planned to have students in the advanced mathematics classes work with the technicians and engineers in doing some of the necessary surveying.

The vocational agriculture boys are building the diversions, developing the spring, and establishing contour strips on the cropland area.

The biology classes will obtain laboratory material from the shallow pond. They will initiate long-term studies on the growth and control of aquatic plants and fish populations in the deeper pond. This impoundment will also serve as a source of water for irrigating the playing fields during prolonged dry spells.

Other suggestions for development of the land laboratory include a limited Christmas tree plantation, some reforestation on an open hillside, a timber stand improvement project in the wooded tract, and the improvement of wildlife habitat. These projects will be done in cooperation with state forestry and wildlife personnel.

Under proper guidance the biology students will plan and develop a nature and conservation trail. A local sportsmen's group has indicated a willingness to provide funds to construct an outdoor classroom at an appropriate spot along the trail, and a Boy Scout troop has offered to construct three small bridges that make parts of the laboratory easily accessible. This type of involvement is highly desirable in maintaining school-community relationships.

Conservation deals with the management of land, water, minerals, plants, and animals. Consequently, many learning experiences in conservation are best provided out-of-doors where the resources exist.

Unless schools make some provision for real work with natural resources, many children will never have firsthand conservation experiences. The development of a school land laboratory offers a practical and inexpensive way to meet these needs. ♦

Two high school girls get experience with compass and increment borer on a forest growth study plot.

A firsthand look at what to teach . . .

Western teachers go to school in Oregon forest setting

By Roy A. Johnson
Soil conservationist, SCS, Hillsboro, Oreg.

How would you like to go to school in an outdoor classroom nestled high in the Cascade Mountains? That is what teachers from Oregon, Washington, Idaho, and California did last summer at Hoodoo Bowl Ski Lodge in Oregon's Willamette National Forest. And it was the 13th straight year for the teacher-training workshop on wise use of natural resources.

At the continuation center

The Portland Continuation Center of the Oregon State System of Higher Education sponsors and directs the workshop. Teachers attending receive three credits, either graduate or undergraduate, for the course.

There were three 1-week sessions during the summer, with 36 teachers attending each one.

Continuation center curriculum planners believe the best place to teach resource conservation to teachers and school administrators is outdoors. Students get theory and practical application at the same time at Hoodoo. How resources are related and interdependent is emphasized and demonstrated.

The continuation center uses the team approach in teaching, working with experts of the separate agencies. Resource consultants on the staff are from the Oregon State Game Commission, private forest industries, and the Forest Service and Soil Conservation Service of the U. S. Department of Agriculture. Other resource consultants are used at various stops during field trips.

Private timber companies, power and light companies, soil and water conservation districts, garden clubs, and other groups provide money scholarships for teachers. Last year, these groups donated $3,800.

The schedule for the week-long workshop included:

Sunday afternoon—Gathering soil, plant, insect, and other specimens for study and identification.

Monday morning—Introduction to the Hoodoo area with discussions on geology, climate, soils, forestry, and game management.

Monday afternoon and Tuesday—Outdoor instruction in natural science, soils, forestry, fish and game management.

Wednesday—A firsthand look at the soils, water management, cropping systems, range management, forestry, game management, and recreation on the east side of the mountains.

Thursday—A farm stop where soils, conservation planning, upland game bird management, and woodland management are studied. And a look at tree farm timber man-

agement including woodland soils, forestry reproduction and forest thinning, harvest cutting, tree planting, and tree seed orchards.

Friday—A field study of lava flows, cinder cones, and multiple-use management of national forests; observation of timber harvesting practices, tree planting, and recreational development.

Saturday morning—Using the knowledge gained during the week to make an inventory of the outdoor classroom site and make suggestions about how the site could be used as an outdoor classroom for school children. This was followed by a formal written examination.

At Lost Lake in the Cascade Mountains, Austin Hamer, then of the Oregon State Game Commission, tells a class of teachers about lake management for sport fishing.

Help back home

Teachers and administrators attending the workshop have returned home and helped their coworkers integrate conservation education into the regular curriculum fields of study.

Two fine examples of this are found in the activities of the Bend and Parkrose school systems.

In the Bend schools, graduates of the workshop have been instrumental in developing conservation material to be incorporated into the regular curriculum. The material is now used throughout the school system.

In the Parkrose schools, a committee of teachers—many of them Hoodoo graduates and resource consultants—have developed a "Conservation Scope and Sequence Chart for Soils, Water, Plants, Wildlife, and Minerals" as part of the regular school curriculum. ♦

SCS Soil Scientist Clarence Olds uses a trench to show teachers the characteristics of a soil.

USDA HELPS CITIZENS BEAUTIFY THEIR LANDS

For more than 100 years USDA has worked with the private citizens who own the rural lands that comprise three-fourths of our Nation's area. While these citizens decide how their lands will be used, USDA encourages and helps them in many ways to maintain beauty where it exists, to restore beauty where it has been marred, and to create beauty by using land, water, and forests in ways which enhance the quality of environment for man.

Soil and water conservation districts in the United States derive their powers and responsibilities from enabling acts of each of the 50 States and Puerto Rico.

These conservation districts have challenging and ever-widening responsibilities for conservation and development of the Nation's soil, water, and related resources. ♦

Michigan schools put real action into conservation education

By James A. Miller and Palmer G. Skalland

Director of outdoor education, Coldwater Public Schools, Coldwater, Mich., and state soil conservationist, SCS, East Lansing, Mich.

With outdoor classrooms now on at least 287 Michigan school grounds, very few of the State's young people will finish public school without some introduction to conservation of natural resources.

Students in many schools can just step out the door and see conservation in action. Some of them can look out the window and see a tiny watershed protection program doing its job.

To plan it that way, schools become soil conservation district cooperators like any other landowner and receive onsite technical assistance from the Soil Conservation Service.

SCS State Conservationist Verne Bathurst has instructed fieldmen to adapt conservation planning on school grounds to meet specific teaching needs. In most instances, it is possible to provide examples of a wide variety of conservation practices that demonstrate the intelligent management of resources.

A model watershed

Lincoln Elementary School at Coldwater is a good example. The school was built next to 117 acres of park and fairgrounds. The builders used some excess excavated soil to build a small model watershed—complete with detention dam, diversion, and grassed floodway. Water coming off the roof and the lawn was directed to put on a show for the children watching from beneath the roof overhang. The backslope of the dam has been treated as a wildlife habitat.

Carlo Heikkinen, superintendent of Coldwater Public Schools, and Hale Pearce of SCS, who assisted with the overall plan, say the acre-and-a-half watershed is even better than a full-sized one for showing pupils how water-control measures function. Others who assisted with the plan were Jerry Fair, the school architect, James A. Miller, director of out-door education, and school board members, together with local Soil Conservation Service personnel.

The plan included:

(1) A diversion of the water from the school building.

(2) A stone-lined waterway, built by students, to carry the water to a 4-foot lower level.

(3) Grass plantings on the lawn which had been reshaped.

(4) A diversion terrace to divert water from the upper school ground to a catch basin 6 feet below and over a grassed waterway leading to a cement block erosion-control structure at the river.

(5) A gradient terrace on the lower school ground to break up the slope and prevent erosion.

Additional plans for outdoor classes at Coldwater include some phases of the entire curriculum. These may include a sundial for time studies, a hole in the lawn for soil profile studies, a history chart using the sidewalk as a scale of years, or a United States map painted on the parking lot.

Another example is at Ann Arbor High School where the conservation classroom covers 27 acres. Ten acres is in woods that are laced with nature trails. There is also a pond. One open area was kept as a farm field and treated with stripcropping and contour farming. Dr. Bill Stapp is the prime mover for the project. He is also a conservation education consultant and a professor for the University of Michigan's School of Natural Resources.

Not every school, however, can have a park next door, a watershed on the grounds, or a 27-acre site, but nearly every school has a little space. The Fletcher Elementary School at Ypsilanti has less than an acre, but it boasts autumn-olive plantings, multiflora rose, plots of grass, and a drainageway.

If students and teachers want to look further into conservation, the Kalamazoo Nature Center has 500 acres where busloads of young citizens can see everything from tropical plants to terraces. Students from

A gradient terrace gives the school grounds protection from erosion and the students a demonstration in conservation.

Students from Coldwater Public Schools visit a seedling pine and spruce nursery used in developing an outdoor laboratory.

about a 40-mile radius are regular visitors, but they come from all over the State at times. Last year 30,000 students visited trails with well-marked conservation practices, soil formations, plant species, and natural wilderness. Supported by endowments, membership fees, and service charges the center offers conservation education ranging from outdoors appreciation for first graders to training for teachers.

Training for teachers

Best of all, the school forces in Michigan are squarely behind conservation education. The universities include courses for teachers. The State Department of Education has a full-time outdoor education consultant in Al Dighera. He will serve as recording secretary for the committee on conservation education, made up of teachers, educators, and conservationists.

Groundwork was laid several years ago by Benjamin E. S. Hamilton, a curriculum consultant for the State superintendent's office. He serves as permanent secretary to the Conservation Education Committee which meets several times yearly to provide the curriculum leadership in conservation education. SCS is a member of this committee and is represented by the state soil conservationist.

Eastern Michigan University at Ypsilanti has a 6 weeks' summer shortcourse for teachers called the Biology, Earth Science, and Resource Use Institute. Dr. Lawrence Ogden, associate professor of geography, and his associates choose from 200 or more applicants to fill the 35 spaces each year. The National Science Foundation sponsors the institute and provides scholarships to those who attend. Last year teachers from 22 states came for the study.

John Trustdorf, SCS work unit conservationist at Ann Arbor, is one of many SCS people throughout the state who takes the group on field trips.

The Higgins Lake Conservation School, a summer camp for teachers, is another meeting which attracts a full house each year. The Michigan Conservation Department sponsors the school.

Two things make Michigan a leader in conservation education. First, by including it in the curriculum, the State Department of Education, universities, and public schools lay the framework for teaching conservation.

Next, the teacher is given the know-how and the facilities for teaching. Courses in conservation are available, and a site for studying the natural world and conservation principles has been provided near at least 287 school grounds. With a little support and technical help from SCS and conservation district people, the teaching is done by trained teachers on a do-it-yourself basis.

In this way, a new generation of land users learn conservation in a state that believes in conservation and acts on this belief. ♦

SEDIMENT HURTS RECREATION AND FISHING INDUSTRY

Sediment greatly reduces the attraction of many lakes and reservoirs for swimming, boating, fishing, and other water-based recreational activities.

It destroys the spawning beds of game fish, ruins their eggs, and reduces their food supply. Fish eat the worms, insect larvae, and other small aquatic animals that feed on microscopic plants, but muddy water shades out light, interfering with the growth of the microscopic plants.

In many small streams, sediment fills the deep pools that provide a refuge for fish during the dry season.

Most streams and lakes no longer have so many fish as they once had. Less desirable species, such as carp, sheepshead, and buffalo, that thrive in turbid waters, are replacing the game fish.

In the broad, shallow bays of western Lake Erie, fishing for yellow perch, cisco, and whitefish was once an important industry. ♦

Excessive pond seepage

Excessive seepage in farm ponds is usually due to soils in the pond site that are too permeable to hold water.

De suelo y agua

Conservationists of many lands learn in Puerto Rico

By Joaquin F. Marrero

Formerly soil conservationist, SCS, San Juan, Puerto Rico

Trainees in soil and water conservation question District Supervisor Mariano Mari (since deceased) on a visit to his dairy farm.

About 15,000 people from 143 countries have received training under foreign assistance programs in Puerto Rico since May 1950.

That first year, 145 foreign participants and observers took part in the program. The number has continuously increased.

The Soil Conservation Service and other agencies of the U. S. Department of Agriculture have been active in this program since 1952. In 1967, 242 came to Puerto Rico for training in agriculture alone.

The majority of the visitors have come from Latin America where the native language is Spanish, the same as that used extensively in Puerto Rico. Others came from Asia, Africa, and the Caribbean Islands.

Firsthand experience

Most of the participants in the program get the training under an agreement between USDA and the Agency for International Development.

In fiscal year 1967, the Federal and Commonwealth Government agencies provided training to 242 persons in agriculture. This training was in soil and water conservation, extension education, supervised credit, cooperative organizations, forestry, agricultural research, and rural sociology. Fifty-one of these participants spent some time with the Soil Conservation Service.

The visitors assigned for training with the SCS have learned about the organization and operation of the Service and of soil and water conservation districts. They have been given on-the-job training in how these organizations help landowners plan for and use conservation practices. Many of these visitors have returned home and applied this knowledge to improving natural resources in their own countries.

Many of those taking part in the training program in Puerto Rico have said that an important benefit to them has been the opportunity to evaluate soil and water conservation practices and procedures that they can best use in their countries. They compare their economic development, type of agriculture, availability of labor, and related factors with those of Puerto Rico and find the problems are quite similar.

"My visit to Puerto Rico was a highlight of my training in this program," said Abdulai Adaji of Northern Nigeria. "We have learned how we can develop our own country, which has similar conditions to those of Puerto Rico. We can apply soil conservation methods we learned in Puerto Rico to our own conservation work at home."

Just like home

James Akande, also from Northern Nigeria, said it would have been helpful to spend more time in Puerto Rico because the climate and crops there were similar to those of his own country.

"After our training in Puerto Rico, I knew a lot about the operation of the Soil Conservation Service and soil and water conservation districts," said Agu Mikpa of Eastern Nigeria.

Many participants in the program found added advantages to their stay in Puerto Rico from visits to the homes of SCS field personnel and participation in social and civic activities.

Technical assistance for those taking part in the program in Puerto Rico has been handled through the

Practice in the use of the farm level is part of the training of Manuel P. Singson from the Philippines.

Office of Technical Cooperation, Commonwealth of Puerto Rico, Department of State.

Orientation and language

Before reporting to the agency to which he is assigned for training, the participant is given an orientation in English or Spanish, depending on the language he better understands. The orientation deals with the background of social, cultural, religious, political, agricultural, and industrial life of Puerto Rico and methods of solving island-wide problems. He is also provided information concerning transportation, health, and medical needs, and other personal matters.

The length of the training period with SCS varies from 2 to 5 days for groups and from 2 to 4 weeks for individuals. In some cases, such as those being trained in soil survey and classification, the training lasts as long as 3 months.

A short course of 3 to 4 weeks for multicountry groups has been conducted in the past 4 years. For these groups, the SCS Caribbean Area program staff conducts intensive training in all phases of soil and water conservation.

Participants from South and Central America, Africa, and Asia find definite similarities in crops, climate, and topography to those of their own countries.

Visitors have been favorably impressed with Puerto Rico, often referred to as the tropical showcase of the Western Hemisphere. They have said that Puerto Rico's wide variation in topography and climate, and in agricultural and industrial development, offers them excellent opportunities for interesting training. ♦

URBAN POPULATION EXPLOSION

Seventy percent of the people in the United States are living on about 1 percent of the land.

If this trend is allowed to continue, 100 million more Americans will, by the year 2000, be stacked on top of the 140 million already in urban areas. ♦

Counties to maintain RC&D water-control measures

Six South Carolina counties in the Lowcountry Resource Conservation and Development Project area have agreed to take over operation and maintenance responsibility on Public Law 566 and RC&D flood-prevention and drainage installations within their boundaries.

Charleston County has had the policy for some time of maintaining community drainage and flood-prevention projects, but until recently such work in the other five counties was the responsibility of the landowners in the respective project areas.

The move was touched off when Cottageville, an incorporated town in the Colleton Soil and Water Conservation District, applied for resource conservation and development assistance on flood prevention and drainage. Preliminary data developed by the Soil Conservation Service indicated that property owners would have to pay 20 to 30 mills of tax for operation and maintenance.

Charles Adams, chairman of the project, organized 21 community leaders and approached the county legislative delegation at a public meeting. Within a week the delegation voted to assume the maintenance and operation of all such projects within Colleton County. The remaining counties in the project area took similar action, and Berkeley County went even further. Its delegation voted to include community-type ACP group jobs.

"This is tremendous progress," says Charles Fraser, chairman of the Lowcountry Resource Conservation and Development Project Commission. "Now we should be able to develop the Lowcountry."—GEORGE E. HUEY, *assistant state conservationist, SCS, Columbia, S.C.* ♦

Student teachers join in district program to give children the facts of conservation

By Barbara Restle

Supervisor, Monroe County Soil and Water Conservation District, Bloomington, Ind.

A pilot program that gives a continuing conservation education to children from the first to seventh grade has been started by the Monroe County Soil and Water Conservation District in Indiana.

Student teachers from Indiana University in Bloomington and other volunteers in the district help teach the 1-hour-a-week classes.

District supervisors initiated the program, the first of its kind in Indiana, at Washington Township Consolidated School in Bloomington. The student teachers are fulfilling requirements for a degree in elementary education under Professor Prevo Whitaker of Indiana University, who is also secretary-treasurer of the district.

Professor Whitaker, Wayne Fix, SCS work unit conservationist, and the author held meetings with the Washington school principal, teachers, and others to develop plans for the course.

A custom-tailored course

The course may touch on any phase of man's relationship to his natural environment, from how the White River got polluted to how many trips in 12 hours a bird makes away from her nest hunting insects.

The conservationists assisting with the program make an effort to custom fit the subject matter to specific age groups, giving the teachers opportunity to carry conservation into many areas of study.

The fifth grade has integrated a new science program with conservation interests by experimenting in making soil. They observe what happens when leaves, sand, and fertilizers are mixed and let stand for a period.

The sixth grade has been given many class hours of instruction on land use. During one session, a conservationist discussed land capability and explained why some of the "hills and hollows" of southern Indiana are not suitable for farming.

All the classes have field trips to see actual examples of the things discussed in lectures. All 220 children were taken to their new school site in four shifts. The older children were put to digging a 2-foot-deep hole to obtain soil samples at various depths and see the differences between topsoil rich with organic matter and the deeper subsoils and parent materials. Earlier in the semester all the students had run the experiments in growing peas or corn in topsoil and subsoil and to observe the health of the plants.

All the classes also planted conifers to serve as a windbreak for the future playground. Three sink holes on the new school site were inspected, and students learned that sink holes and caves are a natural feature of limestone country.

During the spring semester Joe Lamendola, biologist of the Indiana Department of Natural Resources, spoke to a large group of students about the needs of wildlife.

Ned Woodward, Monroe Lake conservation officer, spoke about migrating birds and told how special areas in the new reservoir have been designated off limits to power boats to insure resting and breeding places for ducks.

A state forester, John Datena, led student groups into wooded areas identifying trees and explaining plant succession. The forester showed how to estimate the height and board feet of trees by using a tree-measuring stick.

The regular teaching staff at Washington School was encouraged to introduce conservation ideas into their classes in art, math, biology, geography, and history. For the first three grades, art projects proved most meaningful in putting across concepts in conservation.

Teachers had the benefit of a wealth of educational materials from such sources as the Massachusetts Audubon Society, National Audubon Society, the Soil Conservation Society of America, Boy Scouts of America, and the Soil Conservation Service.

The Washington Township Farm Bureau donated $75 for a conservation library, and a portable library rack was built to hold the books. The new library includes information on the precarious balance of nature, mammals and birds, geology, and water. To broaden the picture for the midwestern child, a few books deal with arctic and tropical wildlife and conservation problems.

Awareness of resources

The goal of our district is to give students an awareness of natural forces at work in the land. Hopefully, the conservation classes will encourage better citizenship by developing a deeper understanding of natural resources.

Professor Whitaker says, "We must always take advantage of new ways to use our knowledge to help deal with the growing scarcity in world resources. In our community we have had many willing citizens to help us along our way. We started with the supervisors of our district contacting school administrators and enlisting the help of qualified technical personnel and talented local citizens. During the entire semester I can't remember anyone turning down our request for assistance." ♦

The horse is still king on Nebraska ranch . . .

A rodeo family practices conservation

Lew Herstead practices roping to train his horses as rodeo animals. Kathy is his constant companion as he irrigates pasture. In the background (right) is Mitchell Pass National Monument, marking the Oregon Trail of pioneer days.

Signs of the old West are still visible as you travel through Mitchell Pass, the famous landmark for Oregon Trail pioneers in western Nebraska.

The Pass itself has become a part of a national monument, and within sight of it lies Lew and Doris Herstead's horse ranch. Here the horse is still king even though he isn't the main power for transportation as he was in the 1840's.

Instead of prime beef, the Hersteads produce rodeo animals—and rodeo entertainment—to meet the growing demand for recreation. The whole family takes to horseback, and three of the five children have won honors in rodeo competition.

Lou Ann, age 14, has a number of trophies. Her ambition, however, is to finish college and teach history.

Members of the Lew Herstead family follow visible signs of the old Oregon Trail through Mitchell Pass. Left to right are Valerie, Lou Ann, a visiting cousin, Lew, and Kathy.

Valerie, 12, stars in goat pinning.

Johnny, 18 and the chief helper, specializes in horse training and in winning bulldogging prizes at rodeos in three states.

Kathy, littlest cowhand, age 4, never misses a thing as she moves about the ranch on Powderpuff, her favorite Shetland. Joe is the only exception, his early teen desire is for a motorbike.

Doris keeps the household going and patches the ripped britches. She leaves the horse training to the rest of the family but is at home in the saddle when necessary.

"We keep a few cattle to train horses with and market some beef, too," says Lew. The training goes on in their private arena in a protected canyon just under the rim where the wheel marks of the old Oregon Trail are still showing.

To keep horses takes grazing and hay and water—water for the horses and for the grazing and hay. Much more water than Oregon Trail riders had in their wagons at this point in the journey.

A Great Plains Conservation Program contract, with technical assistance from the Scotts Bluff Soil and Water Conservation District, has helped Lew with this part of the business. Two wells with windmills keep fresh water flowing for the horses. Rondo Baca, the stud, has his own private 25-acre pasture and shares a well with other pastures.

Water for the grass comes from an irrigation district. Herstead has seeded 48 acres of an alfalfa-grass mixture on former cropland. In the process of leveling for irrigation, he actually reclaimed about 7 acres. Besides the 3 tons of hay an acre, these fields furnish spring and summer grazing for 27 horses and 20 calves plus year around forage for roping stock and 50 additional calves during fall and winter. Horses are kept on feed 12 hours a day, mostly hay but a little grain for those working hard in the arena.

Meanwhile back on other parts of the ranch more conservation work is going on. The irrigated grazing makes it possible to defer use of 105 acres of range, saving it until fall. Strategic placing of the wells helped with this job, too. And the fencing is arranged to make best use of both range and pasture and still get to water.

This kind of organization lets the Hersteads put seven or eight trained horses a year on the market. They sell to rodeo riders, stockmen, or anyone who wants a working horse ready to go. In a few cases they have trained horse and rider together on a contract basis. Trained cow horses bring about $200 each, and the horse-rider package gets up to $500. They keep eight broodmares on another place to produce the foals for training.

Riders of the Oregon Trail had

no such source of trained stock in their day, but the demand then would not have been what it is today. In this age of expanding population seeking sources of recreation and entertainment, someone must work hard to train the animals that are a part of the show. The Hersteads are doing their part.

Lew won't admit he is a rodeo performer even though he can do that job, too. "Too busy irrigating to go to the rodeo," he says. But the training the horses get, and the supervision this rodeo family gets, all stem from his "horse sense." ♦

Proving a point . . .

The great outdoors is the greatest teacher

School folks down in St. Martin Parish, La., have developed a model 9-acre outdoor education center where students take advantage of nature's handiwork to learn about ecology and resource conservation. The project is so popular that the local school board is already looking for room to expand.

Jeff DeBlanc, St. Martin Parish High School curriculum supervisor, explains it this way:

"Back in 1962, Robert Daspit and I were teaching science at St. Martinville High School. We realized a need for outdoor study. The school board owned 40 acres that was being developed for playgrounds and other school activities. Through Superintendent L. H. Boulet, we persuaded the board to leave 9 acres for outdoor nature study. About that time, the Elementary and Secondary Education Act of 1965 became law, opening up new opportunities for Federal financial help with such projects. We applied for an operational grant of funds under Title III of the act."

Call for help

DeBlanc did not wait for approval to begin work on his pet project. He turned to resource agencies for information to support the proposal and, more importantly, to get the work started. Among the first agencies contacted were the Grande Coteau Ridge Soil and Water Conservation District and the Breaux Bridge work unit of the Soil Conservation Service.

Plans to develop the outdoor classroom called for several things. First of all was a soil survey by SCS soil scientists; then a plant, forest, and wildlife survey by the Louisiana Forestry Commission, Louisiana Wild Life and Fisheries Commission, and SCS working together. The SCS people assisted in locating trails through the area, determined elevations, and designed and staked out a pond. A slough was improved for aquatic plant and animal study.

"By the time the project was approved for Title III funds in 1966, and the first grant of $170,000 allotted, the project was well underway," DeBlanc said. "We immediately put the money to use for outside fencing, roads, buildings, scientific equipment, and labor."

Nature study area

The area is densely covered with vegetation, excellent for nature study. Dr. John Thieret of the Biology Department, University of Southwestern Louisiana, in Lafayette, has identified more than 150 species of grasses, forbs, shrubs, and trees on the area. More than 12 dozen species of animals roam the "classroom," and countless aquatic plants and animals live in the pond and other water areas.

Each of six high schools in the parish has its own plot at the classroom site to study plant, animal, soil, and water resources. Three buildings are equipped with up-to-date equipment for outdoor study in biology, physics, and earth science. There is a closed circuit TV with cameras focused on designated spots for animal study.

The outdoor classroom is developed for three phases of study: 80 percent for biology and ecology, 10 percent for earth sciences, and 10 percent for physics. Math students use the area to solve problems involving calculations of distance, area, and volume of natural features.

Time for study

Time spent by students at the outdoor classroom is scheduled as a part of planned study. Generally 8 to 10 days are spent at the area during a 36-week course. More than 2,000 parish students use the outdoor facilities each year, plus several hundred out-of-parish students and other youth groups. One plot is set aside for local garden clubs and Boy Scouts. Another area is designated for artists. There is also a planetarium and an observation tower.

An additional grant of $80,000 of Federal funds is due in 1968. "This money is already earmarked to develop a lagoon on nearby Bayou Teche, to buy a bus to transport students to and from schools, and perhaps to obtain a full-time teacher with a degree in biology and education," DeBlanc said.

Other plans call for putting in a walk-down trench to study soil profiles and planting a number of introduced plants for study.

DeBlanc and other parish school people see many values in their outdoor classroom. An important one is that the discovery method of teaching is generally more meaningful to all the students. Another is the stimulation for learning among students whose grades have been lagging.

"We all see a need to expand even now," DeBlanc says. "I think we are proving a point: The great outdoors is one of the greatest teachers."—S. B. GAUTHIER, *work unit conservationist, SCS, Breaux Bridge, La.* ♦

Mississippi advisory council enhances agency cooperation in conservation education

By W. L. Heard [1]

State conservationist, SCS, Jackson, Miss.

Mississippi has traded its "scatter gun" approach to conservation education for a "concerted cooperative approach" with the formation of a State Conservation Education Advisory Council.

At the invitation of J. M. Tubb, state superintendent of education, representatives of state and Federal resource-use agencies, schools, and other groups met in Jackson in May 1967 to form a council to work with Department of Education officials on matters pertaining to conservation education.

We agreed that the council should: (1) Draft a constitution and bylaws; (2) define its purpose; and (3) establish immediate and long-range objectives.

Committees were set up to accomplish these assignments, and at a November meeting the council adopted these documents, elected permanent officers and a steering committee for 1968–69, and expressed their views about priority of objectives.

Immediate action

One of the immediate steps was to write the gubernatorial candidates and the incoming state superintendent of education, emphasizing the need for a full-time staff position in the State Department of Education with primary responsibility in the field of conservation education.

Other immediate-action objectives include expansion of summer workshops for teachers and a list of services and material available to teachers from the resource agencies.

Many interested persons have asked us to outline the steps through which the council was formed. In our experience, two key factors stand out:

(1) It is important for any group or agency, seeking to strengthen conservation education in the schools, to realize that the state superintendent has the responsibility for the public school curriculum and education program at elementary and secondary levels.

(2) No single resource agency is in a strong position to sell "conservation education" to the State Department of Education. Educators very much prefer to consider the total resource picture.

Mississippi is fortunate to have the persistent and enthusiastic leadership of P. D. Houston, chairman of conservation education and publicity for the Mississippi Association of Soil and Water Conservation District Commissioners. This group is in an objective position; it has the prestige of lay leaders, and can coordinate the efforts of many other groups.

Groundwork

Over a period of years, Mr. Houston has developed an excellent rapport with the State Department of Education and educators.

In 1966, with responsibility for a conservation education panel at the state association meeting, Mr. Houston included the following educators: A. P. Bennett, director of the Division of Instruction, and R. C. Roberts, state science supervisor, State Department of Education, and Peter Green, principal of Canton Elementary Schools. Also on the panel were David Kistner, Snellville, Ga., chairman of the NACD Education Committee, and Mrs. Hugh Norman, Sr., Summit, Miss., president of the Association's Ladies Auxiliary.

The panel provided an opportunity for these individuals to exchange ideas. Perhaps its most important accomplishment was psychological. Because the representatives for the State Department of Education were speaking their thoughts about conservation education, they were not just listening. They were supporting conservation.

As a result of this meeting, Mr. Houston and representatives from the SCS met with the Department of Education officials to discuss what might be done.

It was not long before the state superintendent of education agreed to take the lead in calling a meeting for the purpose of organizing a council, and we in the Soil Conservation Service were happy to provide some help with planning the initial meeting and suggesting some people to be invited.

We believe the council will provide the concerted cooperative approach to solve conservation education problems. ♦

[1] Mr. Heard is chairman of the Mississippi State Conservation Education Advisory Council.

Soils information used

Soils information guided the building committee of Shady Grove Baptist Church in Rapides Parish, La., in replacing the building that burned in December 1966.

Information provided by the Soil Conservation Service confirmed that the building site was suitable and was used by the architect in determining the foundation needs and designing the building.

The chairman of the building committee, James Melder, requested the assistance after seeing a television program on use of soil surveys.—JACKIE L. SMITH, *soil scientist, SCS, Alexandria, La.* ♦

Mr. and Mrs. Rufus Simmons are proud of their new house (above) built in 1964 to replace their former quarters (below). The old barn was replaced in 1966.

From cow, sow, and hen to a modern mechanized farm

Assistance from USDA agencies helped Rufus Simmons of Henderson County, Tenn., convert his small subsistence farm into a modern agricultural enterprise in a period of 10 years.

In 1957 the Simmons were struggling to rear a large family of six children and eke out a meager living on 87 acres of eroded hill land. Their resources consisted of two work horses, a milk cow, and one brood sow. The family of eight existed in a two-room shack.

Simmons had a 13-acre cotton base and had been trying to grow it on hill land. In 1957 he produced only six bales of cotton on the 13 acres and 180 bushels of corn on 12 acres.

He applied for ACP cost-share assistance on construction of a farm pond in 1957. The Soil Conservation Service technician made his initial visit to help in selecting a pond site. During this first visit he explained other services available from SCS, Farmers Home Administration, and other agricultural agencies.

Mr. Simmons was immediately interested and soon developed a soil and water conservation plan for his farm as a cooperator with the Henderson Soil Conservation District.

He began to apply conservation practices as rapidly as possible. The technician was contacted regularly for information and guidance. In 1964 Simmons was assisted by Farmers Home Administration in purchasing an adjoining farm. The FHA loan provided for a new home, barn, tool shed, machinery, and the application of planned conservation practices.

Simmons has constructed 2,000 feet of open drains, 1,100 feet of diversions, and reclaimed 27 acres of wet bottom land, is using improved crop varieties, applying fertilizer according to needs shown by soil tests, growing cover crops, and is improving pastures and hayland.

The additional land bought raised the cotton base from 13 acres to 22 acres, and in 1965 he produced 38 bales of lint cotton on 22 acres. Fifteen acres of corn produced 80 bushels an acre the same year.

The Simmons now live in a new home with modern conveniences. He has constructed a new barn and tool shed and owns a tractor and a one-row cotton picker. Everyone works at the Simmons' place and they are prospering.—AARON C. PETERS, *work unit conservationist, SCS, Lexington, Tenn.* ♦

Soil workshop helps Michigan sanitarians prevent public health hazards

On January 1, 1968, Michigan's county sanitarians reached for their soil augers and newly published soil surveys and headed back to school, for Michigan's subdivision control act had just become law.

Sanitarians were able to see and feel the difference between soils during the session on soil texture.

The act gives county sanitarians the responsibility for determining the suitability of soils for new subdivisions not serviced by public sewers. It's a responsibility for which many of the sanitarians had no background.

To provide this background, the Michigan Department of Public Health asked the Soil Conservation Service to plan and conduct a 2-day workshop in soils and soil surveys. Three soil scientists (the authors) taught the short course, assisted by Merlin Damon, sanitarian from Macomb County.

Although the 82 sanitarians at the workshop did not become soil experts during the 13 hours of instruction, they did learn about many phases of the soil survey and how they could learn more. Part of the workshop consisted of lab and field exercises in determining soil texture and recognizing natural drainage.

The sanitarians also previewed a new soil judging card which lists the major items affecting the suitability of soils for septic tank filter fields.

Prior to the passage of the act, most sanitarians relied mainly on percolation rates to determine the suitability of soil for building sites. The soil scientists explained that when used alone these tests could be misleading. Soil maps outline areas with fluctuating high water tables where percolation tests can give false impressions. The maps also enable the sanitarians to assess sites during the winter when percolation tests cannot be conducted.

Each sanitarian received a 60-page *Soil Manual for Sanitarians* which had been prepared specifically for the workshop. The manual, containing the same material discussed at the workshop, will serve as a reference for future work.

The reaction to the workshop wasn't long in coming. Several weeks later a soil scientist was asked by a sanitarian to conduct a similar workshop for 20 professional people in his county. Additional workshops have been conducted or are planned for 1968.—BRUCE WATSON, JOHN LONG, AND NEIL STROESENREUTHER, *soil scientists, SCS, Burlington, Vt., and Alma and Harrison, Mich.* ♦

USDA-INDUSTRY FORCE TO STUDY EUTROPHICATION

A joint industry-government task force consisting of USDA and representatives of agricultural industries has been established to investigate the control of eutrophication of lakes. Eutrophication results from excessive fertilization of algae and other aquatic plants in impounded waters by nutrients in pollutants—principally nitrates and phosphates—in municipal sewage, human waste, agricultural fertilizers, detergents, and industrial discharges. ♦

Reservoirs used to tap Rio Grande during peak flow

The Rio Grande River, a geographic boundary for the United States and Mexico, is also a great source of water for crops in the Rio Grande Valley—that is, when the water is up.

Because of seasonal variation in flow, however, there are times when pumping of irrigation water is strictly limited. Then there are times when the water is "free" for pumping without restriction.

To have water when needed by crops, Clarence L. Morris, president of La Casita Farms, Inc., near Rio Grande City, Tex., built, using the farm's own equipment and manpower, the first private reservoirs for farming operations in the Rio Grande Valley. The three reservoirs give La Casita storage capacity of 337 acre-feet of water. The company complied with all water laws and obtained the necessary clearance to use the water from the river.

Morris worked out plans for the reservoirs and pipelines with technical help from the Soil Conservation Service office serving the Starr County Soil and Water Conservation District. Ray Rochester, manager of La Casita Farms, and his brother Jim, ranch foreman, were valuable aids in planning and constructing the system.

"I'd thought about this project for 3 or 4 years," Morris recalls. "I hadn't dreamed I would see this come true."

But come true it did, and with the completion of the project, 750 acres of higher ground were converted from grazing land to vegetable and melon fields, adding their production to the 1,800 acres lying along the river and irrigated by a previously installed system.

An 18-inch asbestos-cement irrigation pipe goes into place at La Casita Farms near Rio Grande City. The same pipe carrying water to reservoirs on high ground when the Rio Grande River is up will return it for distribution later.

The pumping system

The reservoirs at La Casita are supplied by a pumping station at the river with a capacity of 8,000 gallons per minute through 18,000 feet of 18-inch asbestos-cement irrigation pipe. Additional water is pumped from four wells. Six more wells could be coupled to the pipeline in the future, and all 10 wells would provide 4,500 gallons per minute for the reservoirs.

Morris noted that the well water contains more chloride salts than the river water so water from the two sources is blended in the reservoirs.

A pump beside the main 200-acre-foot reservoir lifts water through 12,500 feet of 16-inch irrigation pipe to a 62-acre-foot reservoir.

A 24-inch, gravity-flow pipeline equalizes the level of this reservoir with a third having a 75-acre-foot capacity.

From the third reservoir, irrigation water is distributed through 6,000 feet of 12-inch pipe to serve 250 acres of new cropland. This system has a capacity to irrigate 500 more acres.

Pipelines that carry the water to reservoirs can also distribute water back to the fields for irrigation. The distribution is by gravity flow and is regulated by gate valves at strategic locations along the pipelines.

Depending on the crop, irrigation is by flooding or sprinklers.

Conservation cropping

The major crops grown are lettuce, honeydew melons and cantaloupes, cauliflower, cotton, potatoes, and celery.

La Casita averages 1½ crop acres per year per acre of ground with a double crop every 3 years.

Crop rotation is followed with a different crop grown on each acre of land each year, and to this is added a precise schedule of fertilization and cover crops.

With the assistance of Ray and Jim Rochester, Morris also has directed the leveling and reworking of the land on La Casita Farms and replatting the fields. This has resulted in more uniform irrigation and more efficient use of machinery on the row crops. Pioneering with a reservoir system which stores valuable Rio Grande water at times of high seasonal flow and wise use of its resources are marks of La Casita Farms, Inc., and its management. ◆

Meetings . . .

Nurserymen association emphasizes retail selling

The annual meeting of the American Association of Nurserymen, Inc., takes place in St. Louis, Mo., on July 13–17, and "Meet Me in St. Louis" is the association's theme. Emphasis this year is on retail selling.

The keynote address on that subject will be delivered by Ben Wells, president of 7-Up.

Dates and places

July 7-9, Association of American Agricultural College Editors, Knoxville, Tenn.

July 13–17, American Association of Nurserymen, St. Louis, Mo.

21–25, Business and Professional Women's Club, Minneapolis, Minn.

28–31, National Association of County Government Officials, Washington, D. C.

August

1–2, Great Plains Agricultural Council, Denver, Colo.

5–10, Third North American Forest Soils Conference, Raleigh, N. C.

18–21, Soil Conservation Society of America, Athens, Ga.

18-22, The Conservation Education Association, Colorado Springs, Colo. ♦

District supervisor spreads soil stewardship message

Over the past 6 years Central Aroostook Soil and Water Conservation District Supervisor Charles Knight of Limestone has preached nearly a score of Soil Stewardship Sunday sermons to churches in seven different communities in Aroostook County, Maine.

Besides being a leader in his church, Knight serves as chairman of the Maine Soil and Water Conservation State Committee. During his tenure as a district supervisor, he has helped start four watershed projects, and his district joined two others to form Maine's first RC&D Project.—JOHN MALLEY, *soil conservationist, SCS, Presque Isle, Maine.* ♦

Youth assistants help district supervisors

To give young people a leading role in conservation, the Catawba Soil and Water Conservation District initiated the Youth Assistant District Supervisor Program, the first in South Carolina.

About a year ago the district board of supervisors appointed five "youth assistants." Chosen for their leadership potential by vocational agriculture teachers in the five York County high schools, these students deal with both youth and adult groups in promoting conservation. Members of the first youth assistant board are Arthur Black, chairman; Mike Stokes, vice-chairman; and Bud Johnston, John Buchanan, and Tommy Robbins.

The youths handled the Annual State Bankers-Soil and Water Conservation District essay contest. They carried conservation literature to elementary schools, collected the essays, and presented the awards. More than 600 essays were written by fifth, sixth, and seventh grade students in the district.

To promote soil stewardship, the young supervisors helped plan a conservation tour for ministers and took over the sections on flood damage and sedimentation. They carried soil stewardship handbills to all the supermarkets in the district.

Vocational agriculture teachers like the youth supervisor program.

"It's good to involve the thinking of young people in the adult decisions made in soil and water conservation," says Floyd Johnson, agriculture teacher at York High and also president of the American Vocational Association.

One of Johnson's programs for fourth year agriculture students is to have each one teach a class on some phase of agriculture. Arthur Black taught the activities of soil and water conservation district supervisors to his fellow agriculture students. Black says he's learned there's more to soil and water conservation than building ponds since he has been an assistant supervisor.

Carl Mauney, agriculture teacher at Clover High, likes the contribution this program makes to citizenship. His student, Mike Stokes, has brought a new awareness of conservation to the classroom since he started serving as an assistant supervisor. He introduced a soil stewardship program in the school this year for the first time.

The idea for youth supervisors got going with W. B. Wilkerson, Jr., chairman of the Catawba District. Wilkerson discussed it with John R. Parris, associate executive secretary of the State Soil and Water Conservation Commission, and with the SCS work unit conservationist.

The program was included on the agenda of the 1967 meeting of supervisors, and other districts are now copying the model set. ♦

County government busy in conservation work

Most county governments in California are actively participating in soil and water conservation programs and making use of the services of the Soil Conservation Service and soil conservation districts, a recent county-by-county survey of SCS activities with county boards of supervisors and their planning commissions showed.

All county planning commissions in counties with land affected by the Williamson Conservation Act regulating the zoning of prime agricultural land have formally or informally contacted the SCS for land-capability interpretations. Many county assessors have also been given interpretations of land-capability classifications.

The survey also disclosed that in 37 counties the boards of supervisors are assisting in the program of flood prevention, mainly through the Watershed Protection and Flood Prevention Act.

Some 12 county boards of supervisors have contributed money toward regular or special soil surveys in their counties. These firm pledges amount to more than $75,000. Other counties are formulating proposals for allocating additional funds towards soil surveys which may amount to about $165,000.

Four counties have invited proposals for Resource Conservation and Development projects, and the county supervisors have held public meetings.

Seven SCS conservationists have been appointed by the boards of supervisors to serve on special committees or in advisory capacities to planning commissions.

Direct assistance to several counties has been provided through soil conservation districts by supplying technical information for developing studies or ordinances on conservation and protection of natural resources.

Soils information for use in zoning, parks, subdivisions, disposal areas, drainage, recreation sites, or gravel pit reclamation and the like has been in demand, and nearly every SCS office in the State has furnished this information to county boards of supervisors through the local soil conservation districts.

Finally, the Soil Conservation Service is frequently called on by county officials to supply technical data and assistance for many types of programs. This help has included reporting on acreages of class I and II land in the county; training county assessor's staff on the use of detailed soil maps; developing ordinances for reseeding cuts and fills; preparing conservation plans for outdoor conservation school laboratories and for such county lands as parks, prison farms, and rights-of-way; solving mosquito abatement problems connected with irrigation, tailwater returns, and drainage; relocating roads; planning watershed management; reducing siltation; controlling brushland and wind erosion; and reseeding burns. ◆

Soils study helps solve Guatemala's food and unemployment problems

A soils study made by Rafael A. Boccheciamp, a bilingual soil scientist, Soil Conservation Service, may help substantially to solve some of Guatemala's food production and unemployment problems.

Guatemala's 4.2 million people make it the most populous of the five Central American Republics, and it is growing at the rate of 3.1 percent a year.

The Guatemalan Government hopes to reduce the number of unemployed from overcrowded highland cities near the Pacific Coast by building roads into the northern regions of the country.

At the same time, the Government's National Transformation Institute is making plans to boost agricultural production into these regions and to resettle subsistence farmers on land suited for farming.

But several basic questions that face land developers in any country have to be answered first.

Which soils are best suited for what use? What types of land treatment are needed and how can they be applied?

The local Agency for International Development Mission, called in to study the situation, gave top priority to a soils and drainage study for the Department of Izabal and asked USDA for help. Boccheciamp, an SCS soil scientist in Puerto Rico, volunteered for the job and set out under a 6-month agreement to classify and test soils on about 500,000 acres in northeast Izabel.

He arrived in June 1967 and became impressed by the industry of the Guatemalans appointed to work with him. They would rise as early as 4:00 or 5:00 a.m. to walk from their homes to the truck that carried them into the bush for soils investigations.

His counterpart soil scientists, all graduates of the University of Guatemala, helped by digging pits for soil profiles, identifying soils, and whatever they could do to help.

Boccheciamp found that between 60 and 70 percent of the area was covered with forest. Much of this grew on steep slopes with a thin layer of soil covering limestone or other bedrock.

On these slopes, farmers would cut and burn the forest to clear a patch for planting corn. Without

SCS Soil Scientist R. A. Boccheciamp describes a Galvez soil profile.

fertilizer and lime the corn seldom grew beyond 12 to 18 inches high, and ears were only a few inches long.

The main diet was tortillas and corn. Some farmers gathered edible plants from the forest, but they were hardly substantial.

Boccheciamp saw these farmers' level of subsistence and grew increasingly concerned about their welfare. When he visited their thatched huts and small villages, they welcomed him. By agreement, his job was to advise the Guatemalan Government; and as he worked, he added the desire to help the Guatemalan people directly.

He tried to tell them that soil washed freely from the hillsides when the forest was cut and burned. But few understood. They felt they only had to cut more forest to find new land. Downstream flooding wasn't their problem.

The major problem in the lowlands was drainage. Streams that ran from the highlands on one side to the Motagua River on the other caused frequent flooding during the rainy season. The water table—generally high—fluctuated greatly. Many lowland areas had complex drainage problems.

Boccheciamp concluded that underground water movements would have to be mapped, and expensive engineering works would be required to put such land into crops.

Altogether, he identified 30 different kinds of soil, gave recommendations for their use, and made a map to indicate, from field examinations and soil samples, which areas were suitable for cultivation and what chemicals were needed.

He recommended crops for the soil types, emphasizing high protein crops to put more of this much-needed nutrient into the local diet.

Boccheciamp translated his report into Spanish and returned to Puerto Rico.

A valuable guide for land use planning in northeast Izabel is now available to a Government struggling to apply it. ♦

Review

Cattle on a Thousand Hills. By Dana Close Jennings. *1968. North Plains Press, Aberdeen, S. Dak. 90 pp., illus. $5.50.*

Cattle on a Thousand Hills is the factual story of a third-generation South Dakota ranching family, the Suttons—three brothers and their families who manage five ranches extending some 35 miles along the east side of Oahe Reservoir. The brothers specialize in purebred Hereford bulls of the rugged range type, and quarter-horses, but they also run 850-plus commercial cows, a championship rodeo herd, and the oldest private buffalo herd in the world.

The book includes some history of the first Sutton family ranch (part of which was flooded for the Oahe Dam Project), but is mainly an interesting "how-to" and "why" account of up-to-date ranching methods. Most of their land is in the Great Plains Conservation Program, and they follow such practices as pasture rotation, fertilizing, chemical weed control, cross fencing, and the use of windbreaks and artesian wells. Linebreeding and progeny testing have proved successful, and irrigation is "getting a whale of a try."

The Sutton brothers have won a number of awards as recognized leaders in range management and good land use. But conservation ranching earns more tangible rewards as well. "When we had 28,000 acres on the home ranch, we only ran 800 to 900 cows on the whole spread," they say. "Now, on the three (cattle) ranches together, we're running 1,300 to 1,400 head on 7,000 acres less land."

Cattle on a Thousand Hills describes such ranch-life occasions as roundup and rodeo time and stock sale days. A detailed "ranch terminology" explains many terms likely to confuse readers east of the Missouri. The 90 pages are profusely illustrated.

The book is a happy combination of warmth and authenticity. It can be read for pleasure by the suburbanite with a quarter-acre of crabgrass and for profit by a working rancher.—C. Johnston, *Information Division, SCS, Washington, D. C.*

New publications

Restoring Surface-Mined Land. By The U. S. Department of Agriculture. *1968. USDA Misc. Publ. 1082. 18 pp., illus. $0.15.* The six types of surface mining—open pit, area stripping, contour stripping, auger mining, dredging, and hydraulic mining—lay bare, rearrange into parallel ridges, or scoop out the land like a soup-bowl. Properly treated and managed, the land can be returned to safe and productive use, even become a greater asset to the community than it was before mining. Left alone, it may produce only stream-fouling sediment and acid. Much has been done by Government, industry, and land owners and operators in restoring this land. The bulletin points out that during one 5-year period, 1960–64, more than 5,000 land owners and operators in 500 local soil and water conservation districts in 31 States applied conservation measures to nearly 128,000 acres of surface-mined land with USDA help.

Making Rural and Urban Land Use Decisions. *1968. Soil Conservation Society of America, Ankeny, Iowa. 40 pp., illus. $0.75.* An attractive two-color booklet adds a popular treatment of general land-resource problems to the Society's complement of conservation publications.

The booklet reviews available land resources and current demands in the United States. It discusses planning, both short-term and long-term, and suggests steps for initiating sound land use planning within a community.

The booklet is intended for use by citizen groups as well as state, county, and local governmental units concerned with land use. It is available in quantity at reduced prices.

Credit for preparing the booklet is given to members of the Special Publications Committee: Frank M. Shaller, Iowa State University; D. Harper Simms, Soil Conservation Service; and Ruth L. Hine, Wisconsin Department of Natural Resources.

Grasses and Legumes for Soil Conservation in the Pacific Northwest and Great Basin States. By A. L. Hafenrichter, John L. Schwendiman, Harold L. Harris, Robert S. MacLauchlan, and Harold W. Miller.

1968. USDA Agr. Hbk. 339. 69 pp., illus. Summarizes 32 years of testing grasses and legumes for conservation uses in five plant materials centers of the Soil Conservation Service and cooperating state agricultural experiment stations.

The results of intensive work on adaptation, cultural requirements, and management methods are reported for 134 species and varieties under 10 conservation-use groups: (1) Rapid-developing short-lived, and (2) long-lived, grasses for subhumid and irrigated areas: (3) saline- and alkali-tolerant grasses; (4) drought-tolerant long-lived bunch, and (5) sod, grasses; (6) the bluegrasses; (7) fine-leaved grasses for cover, erosion control, watershed structures, and recreation areas; (8) wet meadowland grasses; (9) grasses for dunes and sandy land; and (10) legumes.

The principal species described are illustrated with excellent original line drawings by Lucretia B. Hamilton, wife of the former manager of the Tucson, Ariz., Plant Materials Center. Colored agricultural zone maps help indicate the range of adaptation of each kind of plant.

Wind Erosion Forces in the United States and Their Use in Predicting Soil Loss. By E. L. Skidmore and N. P. Woodruff. *1968. USDA Agr. Hbk. 346. 42 pp., illus. $0.25.* Detailed information on wind-erosion forces for locations throughout the United States for use in assessing erodibility of field soils and in designing control practices to combat the ravages of wind erosion. The data presented include (1) relative magnitude of wind-erosion forces or the capacity of the wind to cause erosion on unprotected soils, (2) prevailing wind-erosion direction, and (3) preponderance of wind-erosion forces in the prevailing direction. These factors indicate, respectively, potential need for wind-erosion protection, proper orientation of erosion-control measures, and relative merits of proper orientation of control methods. Data are presented by months for 122 locations.

The report is highly technical but the results are shown graphically. Included is a chart for determining potential soil loss from the data presented.

Undergraduate Education in Renewable Natural Resources; An Assessment. By Panel on Natural Resource Science, National Research Council. *1967. National Academy of Sciences, Washington, D. C. Publ. 1537. 28 pp. $2.00.* The panel evaluates trends in natural resource use that affect educational needs, identifies current curricular problems, and recommends a basic 4-year curriculum of "basic core" courses, specialized courses in four areas of emphasis, professional courses, and electives.

Clean Water—It's Up to You. *(1968). Izaak Walton League of America, 1326 Waukegan Road, Glenview, Ill. 60025. 48 pp., pocket size.* Prepared by the League's "Citizen Workshops for Clean Water for America" project. Free copies available from the League.

Soil and Water Research on a Claypan Soil. By V. C. Jamison, D. D. Smith, and J. F. Thornton. *1968. USDA Tech. Bull. 1379. 111 pp., illus. $0.35.* Results of research conducted at the Midwest Claypan Experiment Farm, McCredie, Mo., 1937-62, by the Agricultural Research Service in cooperation with the Missouri Agricultural Experiment Station.

Federal Assistance in Outdoor Recreation. *Rev. 1968. U. S. Dept. Int., Bureau of Outdoor Recreation, Publ. 1. 99 pp. $0.35.* An exhaustive listing, by departments and agencies, and brief descriptions of the services and assistances available to states, their subdivisions, organizations, and individuals.

Vertical Coordination Via Contract Farming. By Marshall Harris and Dean T. Massey. *1968. USDA Misc. Publ. 1073. 101 pp. $0.65.* Furnishes needed insight into the legal-economic nature of farming under vertical coordination contracts and the overall legal-institutional milieu in which such contracts are negotiated and performed.

Private Assistance in Outdoor Recreation. By U. S. Bureau of Outdoor Recreation. *(1968). U. S. Dept. of Int. 68 pp. $0.30.* A directory of organizations providing aid to individuals and public groups, with a list of available publications from each.

Conservation Highlights 1967. By Soil Conservation Service. *1968. USDA unnumbered leaflet, 6 pp.* Digest of the SCS progress report for fiscal year 1967 made available in handy form for insertion in correspondence and similar uses.

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From the Administrator:

Opportunities in Conservation Education

Basic to continued social, economic, and personal development in all areas of human endeavor is recognition and acceptance by each citizen of his responsibility for rational use and proper care of the entire natural physical environment.

Personal commitment for intelligent use and management of natural resources depends on an appreciation of man's interdependence with his environment and understanding of realistic principles of natural resource use. Such appreciation and understanding can best be developed in children and youth.

Since its inception, the Soil Conservation Service has actively supported and assisted with conservation education efforts on a broad scale. As we witness the continuing movement from farm to city with the resulting disassociation of people from the land, we are impressed with the need for greater emphasis on conservation education in the classroom.

Fortunately, conservation education is coming to be recognized in its proper perspective by teachers and administrators. After 2 years of study, a special commission of the American Association of School Administrators recently identified "to make intelligent use of natural resources" as one of nine "imperatives in education."

The National Conservation Education Association phrases its policy: "We believe that a major goal of education is the recognition by man of his interdependence with his environment and with life everywhere, and the development of a culture which maintains that relationship through policies and practices necessary to secure the future of an environment fit for life and fit for living."

SCS heartily applauds the conservation education efforts of these and other national groups of educators.

Conservation principles underlying intelligent use and management of resources and the technological skills needed to protect those resources have their roots in science. But instruction about conservation must go beyond science classes to become part and parcel of the entire educational process that prepares a student to take his place as a responsible citizen of his community, state, and Nation.

Conservation is as much a problem of people as of resources; the subject needs to be incorporated into the entire social sciences curriculum.

Art, music, and literature all are related to man's appreciation of the natural world, its infinite variety and basic unity. Teachers in every subject matter area have found that they can strengthen the content of their courses by relating them to resources and conservation.

A most effective way of helping children learn about natural resource conservation, especially in densely populated regions, is by using the school site as an outdoor learning laboratory in all areas of instruction. Outdoor classrooms are being developed throughout the country, as places where conservation can be a real part of the learning environment. SCS representatives in every community should seek opportunities to provide technical and consultive assistance in developing these areas to make best use of soil, water, and plant resources as instructional tools that serve a practical conservation purpose.

Ideally, planning for the outdoor classroom should begin during the selection of the school site, for which SCS can provide needed soils information.

It is heartening to note the organization and development in several states of conservation education advisory councils through which much can be done to develop sound conservation education programs. In addition to the important state councils, the efforts in some areas to develop county or school-system councils merit our full support.

Nearly 300 conservation education workshops for teachers are held each summer, and colleges and universities are giving increasing attention to instruction in conservation for teachers. Yet, the prime need today is for means for teachers to acquire the knowledge about natural resources and conservation that they must have if they are to provide meaningful conservation learning experiences for children. Our efforts in conservation education are multiplied many times over when, as trained conservationists, we help teachers learn about conservation.

The task of teaching conservation is the responsibility of the teacher, just as farming is the business of the farmer. And, similarly, it is the responsibility of the professional conservationist to provide aid to conservation educators just as it is to provide technical help to land users.

The Soil Conservation Service holds conservation education to be of highest importance, for only a conservation minded people can and will commit themselves to intelligent use, development, restoration, and preservation of our heritage of renewable natural resources.

D. A. WILLIAMS

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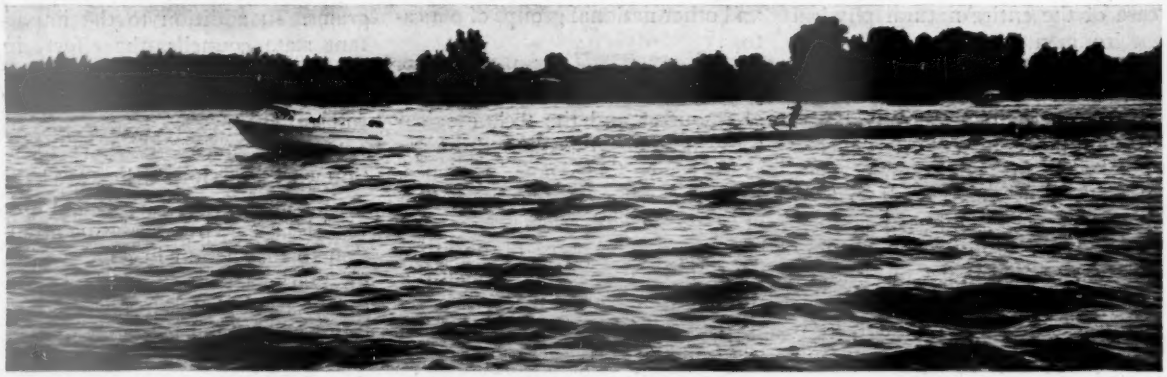
Gravel removal makes way for a beautiful lake and grove



Highway Lake was originally a gravel pit in a bend in the river.

Highway Lake and Jensen Grove, part of a golf course and municipal airport complex, will soon be adding substantially to better rural living in America by providing more recreation facilities to the people of Blackfoot, Idaho.

Highway lake is the result of the Blackfoot City fathers' foresight when Interstate 15 was constructed west of the city. The construction of the highway made it necessary to straighten Snake River. A large bend in the river next to the city was going to be abandoned by construction of a new river channel parallel to the highway. The Blackfoot City Council worked with the State Highway Department and the contractor to take the gravel from this old river channel to build the highway.

This planning and cooperation left the area between Blackfoot and the highway with a beautiful lake for recreation—boating, water skiing, swimming, and picnicking—instead of an ugly, abandoned gravel pit to grow weeds and accumulate trash.

Headgates were installed in the river bank and pipelines placed under the highway to deliver water to the lake.

Plans are to develop the natural wooded area near the lake into a picnic area; maintain the native trees, shrubs, and grass in the grove to give outdoor atmosphere; and install a sprinkler irrigation system to irrigate the plants and make them healthier to withstand the heavy use of the recreation area. Only thistles, burrs, and dead trees will be removed.

The Soil Conservation Service provided technical information on soil, water, and plants to the city planner and Engineering Department. This recreation development fits into the Central Bingham Soil Conservation District's broader program of providing assistance to get conservation on all the land.

Civic clubs, the chamber of commerce, private businesses, and individuals all contributed funds and labor to make their recreation area a reality. Bingham County Road Department and the Blackfoot City Street Department plan to use trucks and other heavy equipment to build the recreation complex.

Tourists are quick to comment about the beautiful approach to the city as they visit with residents of the area.

This community development of Highway Lake and Jensen Grove is bringing the people of the area closer together for better understanding of problems and of each other.—D. Boyd Archibald, *work unit conservationist, SCS, Blackfoot, Idaho.* ♦